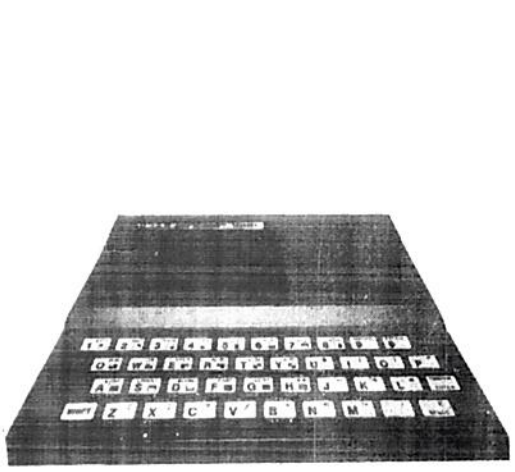
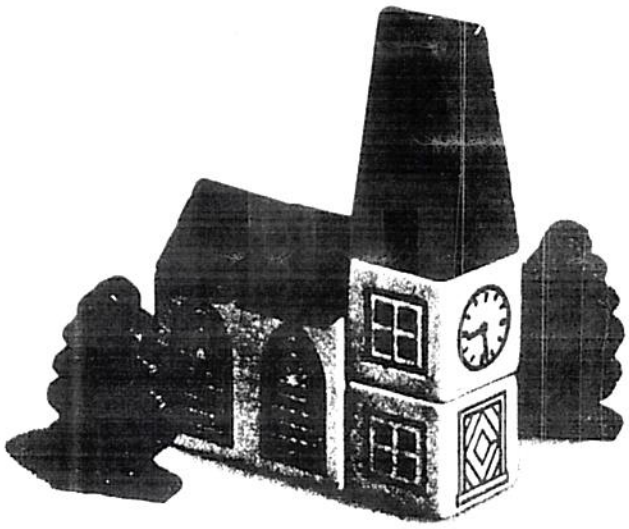
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By Paul Hunter

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ZX INTERFACING BOOKS
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ENTER

Dear Friends,

This issue's guest editorial is by Eben Brown of E. Arthur Brown Co. Mr. Brown has built up quite a business around Timex products and third party items, such as Memotech's peripherals. Starting out small, he advertised in some major computer magazines, including Byte and Computers and Electronics, as well as Sync, and helped to spread the word to people like me who needed to know that there was real support and potential for expansion for the ZX81 and TS 1000. He has developed quite a product line, and we wish him continued success. His company is one place you can expect to find just about anything you want for Timex computer including the TS 2068.

There was a rumor that E. Arthur Brown was dropping their Timex-related products altogether, due to frustration with Timex and the success of Commodore and others, but after seeing their recent catalog it's clear this is not the case at all. It's good to know the rumor was false and that Timex-related items are still the mainstay of E. Arthur Brown Co.

The editorial is not intended to rehash common information but to remind us 2068 users (and to inform new users) that we have a truly powerful machine at our fingertips and that at least one company (there are many others) is providing the best possible support for it.

Another rumor has evolved past the "pure" rumor stage, and into the "within the realm of possibility" stage. Dave Higginbottom of California has formed the Trinity Magnum company, with the objective of distributing the Timex computers under a different name, still manufactured by Timex. Dave is one of the "interested parties" mentioned in the previous issue's ENTER section.

He has proposed to build a network of "Little Computer Stores" across the country to carry all available peripherals, software, and publications for the Timex computers, which would become the TimeStar line. (I suggested Time* when I talked to him over the phone.) We plan to publish more information - and possibly an interview - next month. Keep your fingers crossed!

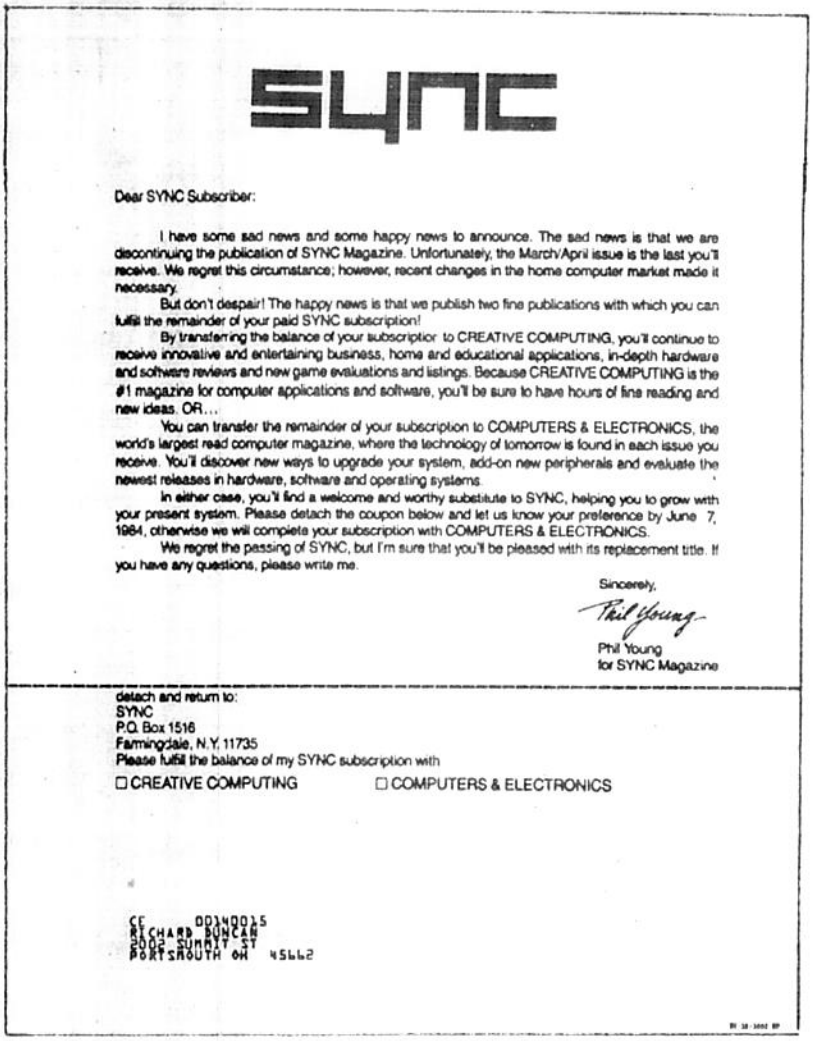
We hope you enjoy "Computer in the Congregation" by Bill Colby-Newton, which describes yet another application for the mighty ZX81/TS 1000. Thanks, Bill.

In the next issue we will be featuring a few pages of information about modems, including reviews of ByteBack's and Timex's modems (and we tell you where you can get either of them CONT --->

TUTOR-INFO

Sad News? Happy News?

Former Sync subscribers received this letter from Ziff-Davis, the publisher of the now defunct magazine. The letter, which was promised back in March, offers Sync subscribers the chance to have the rest of their subscriptions filled with either Creative Computing or Computers & Electronics, two other Z-D publications.



SYNC

Dear SYNC Subscriber:

I have some sad news and some happy news to announce. The sad news is that we are discontinuing the publication of SYNC Magazine. Unfortunately, the March/April issue is the last you'll receive. We regret this circumstance; however, recent changes in the home computer market made it necessary.

But don't despair! The happy news is that we publish two fine publications with which you can fulfill the remainder of your paid SYNC subscription!

By transferring the balance of your subscription to CREATIVE COMPUTING, you'll continue to receive innovative and entertaining business, home and educational applications, in-depth hardware and software reviews and new game evaluations and listings. Because CREATIVE COMPUTING is the #1 magazine for computer applications and software, you'll be sure to have hours of fine reading and new ideas. OR...

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In either case, you'll find a welcome and worthy substitute to SYNC, helping you to grow with your present system. Please detach the coupon below and let us know your preference by June 7, 1984, otherwise we will complete your subscription with COMPUTERS & ELECTRONICS.

We regret the passing of SYNC, but I'm sure that you'll be pleased with its replacement title. If you have any questions, please write me.

Sincerely,

Phil Young

Phil Young
for SYNC Magazine

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Creative Computing is somewhat more applications-oriented, with more emphasis on software than C&E. Regular columns and frequent article for Apple, IBM, Commodore, etc. but none for Timex in the recent past. (Of course Ziff-Davis may want to salvage some of the material already prepared for Sync, and Creative Computing might be the most likely place.)

Personally I didn't feel the need to receive either of these "two fine publications." I sent my form back with the message: "Please REFUND the balance of my paid Sync subscription."

---

for just over $100), and hopefully an article on telecommunications using Timex computers and a national bulletin board and information service for Timex users by Mark Fendrick, creator of S.I.N. (Sinclair Information Network). By the way the modems work with equally well for ZX81s, TS 1000s, TS 1500s, and TS 2068s.

Hopefully we will also more items of interest to 2068 users, besides news and reviews.

Hang in there gang. Things are looking great!

Sincerely,
Rick Duncan

Good News For Worried 2068 Computerists

A Guest Editorial

By: Eben Brown of E. Arthur Brown Co.
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We all know the first TIMEX computer was more than a toy. In fact, it was more computer than most people ever realized. With the success of the TS1000, TIMEX set themselves to the task of designing the best machine they could. They decided they'd rather be the best, not the cheapest. The result is the TIMEX 2068 Professional computer.

After it's quiet release in November, every computer magazine and trade journal that's tested it has given it rave reviews. And for good reason. It's capable of 16 color displays with up to 512 X 192 resolution. It has a full typewriter format keyboard with dual shifts, caps, and space bar. It has 72K of memory of which 24K is a sophisticated operating system and 48K is useable RAM. It's cartridge port can hold an additional 56K of programming. It's futuristic bank switching facility can handle up to 16 Megabytes of memory. This sort of memory is unprecedented...you haven't seen it in any other personal computer at ANY price. Programming the TS2068 is a cinch. It has the world famous Sinclair BASIC language...meaning one touch entry of commands along with extended functions not normally sold with a stock computer. For example, programming a sine wave on the TS2068 takes only 5 steps. It takes 15 steps on a Commodore 64. And, you don't have to wait until you run the program to find bugs. The TS2068 has automatic syntax error checking...it knows what commands you're supposed to give it and it tells you as you program!

The TS 2068 has some remarkable visual capabilities. You can display up to 64 characters on the screen. The "screen" can be anything from a black and white or color TV to a green or amber monitor, to a composite video color monitor, to an RGB color/green monitor...it can handle the best monitors available, but since it doesn't have to, you can grow with it. There are sophisticated sound synthesis features, too. Up to 4 channels or sounds can be running at the same time, each somewhere in it's own 8 possible octaves!

A couple of months ago, we sent out a special supplement to a small portion of our mailing list. The headline read: TIMEX Snatches Defeat from Jaws of Victory. What followed was a somewhat depressing account of how TIMEX had bowed out of the computer business in February and of how no one was yet sure where their customers could get supplies and service. It's now 2 months since the fateful date and I think things might be looking pretty good.

For one thing, we're fortunate that TIMEX wasn't the original manufacturer of many of their peripherals. We've found the maker of the joysticks and can supply them at the same price. We've found the manufacturer of the 2050 modem and are buying them directly from them rather than TIMEX. The full size printer is a Mannesmann-Tally MT-88. We've taken on a very good Centronics Parallel

Interface for the 2068, and even have a new word processor for it. The disk drive interface is very near being ready for release, so we can offer you pretty much the same package TIMEX was promising.

Yes, but what about the future? Well, TIMEX computers are not really the products of TIMEX Corporation. They're the technology and genius of Sinclair Research in England. Sinclair won't be starting up manufacturing of the TIMEX versions. But it's reasuring to know that they are healthy and don't look at all like they're quitting. Now that TIMEX has left the market, Sinclair will be re-entering the American market...probably around Christmas. Making Sinclair-compatible software and peripherals work with TIMEX ones requires minimal adjustments or changes. So even without TIMEX, you still have a computer company!

We're currently working on a new line of products developed from English companies that supply software and peripherals for the Spectrum. You're going to be amazed at what's available in just a few months. Yes, things looked pretty black a couple of months ago. But hang with us! We'll do our best to bring you the products you want for your TIMEX-Sinclair computers!

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PROGRAM BVP

By: Ken Lewis

Solution of the Linear Boundary Value Problem

In this article, one of two approaches to solving second order boundary value problems is discussed. The method presented here utilizes a very simple matrix formulation, but this simplicity is largely lost if nonlinear problems are treated with it. Thus this program should be used only with linear problems of the form

$$\frac{d^2X}{dt^2} + f(t)X = g(t) \ , \ X(a) = c_1 \text{ and } X(b) = c_2. \qquad (1)$$

The region $a \leq t \leq b$ is first divided into n+1 equally spaced intervals of length Δt. The differential equation is then represented as a (central) difference equation, e.g. the jth point along the region is represented as

$$\frac{X_{j+1} - 2X_j + X_{j-1}}{(\Delta t)^2} + f(t_j)X_j = g(t_j) \qquad (2)$$

There are n equations of the form (2), one for each interior point of the region $a \leq t \leq b$; there is also one unknown value of X for each interior point. This means that there are n simultaneous linear equations in n unknowns $X_1, X_2, \ldots X_n$. This set can be written as

$$X_2 - 2X_1 + C_1 + X_1 f(t_1)(\Delta t)^2 = g(t_1)(\Delta t)^2$$
$$X_3 - 2X_2 + X_1 + X_2 f(t_2)(\Delta t)^2 = g(t_2)(\Delta t)^2$$
$$\vdots$$
$$X_n - 2X_{n-1} + X_{n-2} + X_{n-1} f(t_{n-1})(\Delta t)^2 = g(t_{n-1})(\Delta t)^2$$
$$C_2 - 2X_n + X_{n-1} + X_n f(t_n)(\Delta t)^2 = g(t_n)(\Delta t)^2$$

Defining $d_i = -2 \ f(t_i) \ (\Delta t)^2$ and $b_i = g(t_i) \ (\Delta t)^2$, the set can be written thus:

$$\begin{vmatrix} d_1 & 1 & & & \\ 1 & d_2 & 1 & & \\ & 1 & d_3 & 1 & \\ & & \ddots & & \\ & & & 1 & d_n \end{vmatrix} \begin{vmatrix} X_1 \\ X_2 \\ X_3 \\ \vdots \\ X_n \end{vmatrix} = \begin{vmatrix} b_1 \\ b_2 \\ b_3 \\ \vdots \\ b_n \end{vmatrix}$$

The coefficient matrix is tridiagonal, and can be solved with the method for such systems outlined in a previous section. The matrix method has an accuracy on the order of $(\Delta t)^2$, hence the easiest way for ensuring reasonable answers is simply to obtain solutions for progressively smaller values of Δt, until the results indicate adequate convergence.

THE PROGRAM

Program BVP directly utilizes the ideas discussed above. Before d_i and b_i can be computed, the (problem specific) functions f(t) and g(t) of equation (1) must be input into the program, within the quotation marks of statements 25 and 26, respectively. These functions will of course change from one problem to another. Once these changes to the program are made, the "RUN" mode can be entered. At this point, five pieces of data are prompted by the program: (1) the number of segments which the region $a \leq t \leq b$ will be divided into, i.e. the number n-1 of points at which calculations will be made; the value of t at the left end of the region (a); the value of t at the right end of the region (b); the value of X at the right end of the region (X(a)); and the value of X at the left end of the region (X(b)). After this data is entered, execution will proceed, and the results are printed out in a table of t and X values.

EXAMPLE

Consider the boundary value problem

$$\frac{d^2X}{dt^2} - (1-t/5)X = t, \quad X(0) = 0 \ , \ X(1) = 2$$

First, the program is altered at lines 25 and 26. The right hand side of line 25 will read "-(1-T/5)" and the right hand side of line 26 will read "T". The "RUN" mode is entered. Five prompts, which require five responses, begin to appear. The first of these is: "INPUT N-NO. SEGMENTS". The value 10 is entered. The second prompt is "INPUT TEND1". The value 0 is entered here. The third prompt is "INPUT TEND2". The response is 1.

```
 1  REM BVP
 2  DIM A(100,4)
 3  PRINT "INPUT N-NO. SEGMENTS"
 4  INPUT N
 5  PRINT "INPUT TEND1"
 6  INPUT TEND1
 7  PRINT "INPUT TEND2"
 8  INPUT TEND2
 9  PRINT "INPUT X(TEND1)"
10  INPUT XO
11  PRINT "INPUT X(TEND2)"
12  INPUT X1
13  FAST
14  LET DH=(TEND2-TEND1)/(N)
15  LET DH2=DH*DH
16  LET NM2=N-2
17  LET NM1=N-1
18  REM **********************
19  REM **********************
20  REM CHANGE THE ARGUMENTS OF
21  REM THE FUNCTIONS F$ AND G$
22  REM WITH EACH NEW PROBLEM
23  REM **********************
24  REM **********************
25  LET F$="-(1-T/5)"
26  LET G$="T"
27  REM **********************
28  REM **********************
29  REM ********************
30  LET T=TEND1
31  FOR K=1 TO NM1
32  LET A(K,1)=1
33  LET A(K,3)=1
34  LET T=T+DH
35  LET A(K,2)=-(2-DH2*VAL F$)
36  LET A(K,4)=DH2*VAL G$
37  NEXT K
38  LET A(1,4)=A(1,4)-XO
39  LET A(NM1,4)=A(NM1,4)-X1
40  GOSUB 50
41  PRINT "T       X"
42  PRINT TEND1;"  ";XO
43  LET P=TEND1
44  FOR J=1 TO NM1
45  LET P=P+DH
46  PRINT P;"     ";A(J,4)
47  NEXT J
48  PRINT TEND2;"     ";X1
49  STOP
50  REM SUBROUTINE
51  FOR I=2 TO NM1
52  LET A(I,1)=A(I,1)/A(I-1,2)
53  LET A(I,2)=A(I,2)-A(I,1)*A(I-1,3)
54  LET A(I,4)=A(I,4)-A(I,1)*A(I-1,4)
55  NEXT I
56  REM BEGIN BACK SUBSTITUTION
57  LET A(NM1,4)=A(NM1,4)/A(NM1,2)
58  FOR J=NM2 TO 1 STEP -1
59  LET A(J,4)=(A(J,4)-A(J,3)*A(J+1,4))/A(J,2)
60  NEXT J
61  RETURN
```


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The fourth prompt is "INPUT X(TEND1)". Here, 0 is entered. Finally, the last "INPUT X(TEND2)". The value 2 is entered. The solution is printed out as:

```
T       X

0       0
0.1     0.15826359
0.2     0.31907816
0.3     0.48495588
0.4     0.65839218
0.5     0.8418857
0.6     1.0379582
0.7     1.2491607
0.8     1.478108
0.9     1.7274714
1       2
```

Interested in Solving Matrix Eigenvalue problems or Computing Concentration Gradients with your TS?

I am currently completing a book of numerical programs entitle SUM (Small Users Mathematics) - A Compendium of BASIC Numerical Programs for the Small Systems User. These programs have all been written an tested on the T/S 1000, so they'll work on your 2068 (or, for that matter, can be easily adapted to any machine using MBASIC). I intend to market the book for $15.00, however, as a special prepublication offer, the book will go for $10.00, postage paid. Send checks and inquiries to Box c-6, 767 Hopetown Road, Chillicothe, Ohio 45601. Publication date is scheduled for July, 1984.

ZEAL DISASSEMBLER

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This is the only full-featured machine language disassembler available for the 2068. Some reasons for its wide acceptance since first being announced in the final issue of SYNC:

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A Computer in the Congregation:

By: William R. Colby-Newton

At a recent minister's forum of the local jurisdiction of my denomination, I was asked to write a short article for our newsletter on the subject of the computer and its use in the church. This article is an outgrowth of the sketchy report I did for that publication.

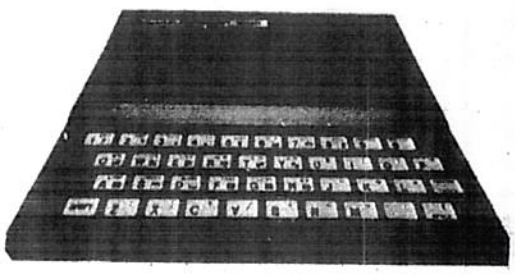
As an avid Timex/Sinclair "computerist" and pastor, I am convinced that the computer does indeed have a bright future in the church, and that every church can reap enormous benefits from owning its own system. I am, moreover, completely biased toward the Timex/Sinclair 1000 computer, which is the core of the system I own. This system underscores my belief that a church does NOT have to spend "megabucks" in order to acquire a versatile computer which meets its needs. For the price I paid for my system, even the smallest congregation can obtain quality equipment.

This article will be divided into three major sections, Why?, What?, and How?, with a few concluding remarks.

I. A Computer in the Congregation: Why?

Even in this electronic day and age, it is still by no means a foregone conclusion that everybody is rushing out to buy a computer.

The church is no exception. It is a notoriously conservative institution, which is to say that "new-fangled" things generally only tend to become acceptable in the church long after they have ceased to be "new-fangled" in society at large. The tendency to adhere to the "tried-and-true" is probably nowhere as strong as in the church. Thus, although a growing number of churches have been seeing fit to purchase one of these electronic marvels, most have not.



The Rev. William R. Colby-Newton
8512 Puritan Street
Downey, CA 90242

Among the first questions, then, that a church might ask when confronted with the idea of buying a computer is, quite simply, Why? "Our church has been doing fine all these years without one; why should we get one now?"

A computer can aid a church in countless ways, but perhaps we could boil all of them down into two words: Time and Efficiency. A computer can give the pastor and his/her entire church program more of that precious commodity of time, and increase the efficiency of output in the process. The many organizational, pastoral, and financial operations of any given parish almost always entail great amount of time and effort. The computer can cut these expenditures down to size.

Organizational. As in any organization, there are in a local church reports to prepare, files to keep up to date, and various records to keep track of. If a computer is employed for record-keeping, files can be kept to a much more manageable level. For example, I am currently employing my Timex/Sinclair "Organizer" software to create a current list of the members of my parish, with the pertinent data regarding each member in individual data-fields. This software can also be used to keep running files on stewardship, visitations, and so on. When these files need to be updated, it is a simple matter to do so using the "Organizer's" built-in "search" routine. With my printer, I can also take the information in the program and make as many "hard copies" as I want, with whatever revisions and deletions are necessary, without having to redo everything on a typewriter or by hand. Filing is made much simpler, faster, and more efficient.

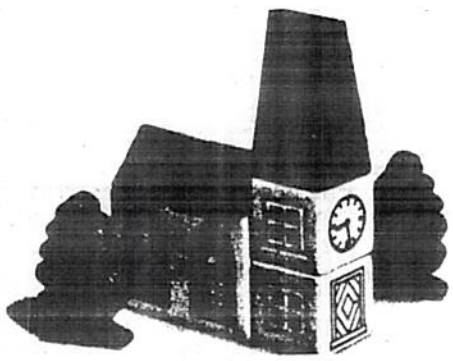
Pastoral. "Saving time" and "increasing efficiency" are terms which cannot help but be music to a pastor's ears. In the administration of the pastoral office, saving oneself time form the toil of repetition and completing important tasks more easily and efficiently certainly can contribute to greater effectiveness.

Pastors are the original wordsmiths. There probably no other profession or calling which demands its members to work with words and concepts more than the ministry. Creeds, theological exegesis, hermeneutics, doctrines: All these are the typical pastor's stock in trade. It is precisely here that the computer can truly be a Godsend for a minister. In its application as a word processor, not just data processor, the computer can radically reduce the amount of time it takes to, for example, write the Sunday sermon. Some clergy computerists claim that they work up to 40% faster on a computer than a typewriter.

This is partly due to the standard word processing feature called "automatic wrap," by which the computer automatically starts a new line on the screen when the right margin has been reached. Inputting data into the machine is also much faster than its counterpart in regular typing. There are no moving parts on a computer; when one presses a key, the character is transmitted literally at the speed of light onto the monitor and into the computer's memory. Making corrections is just as fast; one simply moves the cursor back to the mistake and either deletes it or just types over it. Margins can be automatically justified (my word processor give me the choice), and the computer will also automatically paginate one's pages, regardless of how many insertions and deletions one makes in the text. Moving large blocks of text around in the work is also no problem whatsoever. And, of course, all this can be done while the text is still on the screen; when the text is as it should be, the user dumps it to the printer, which creates a flawless copy. Imagine what this means for those many pulpiteers who rewrite their sermons! In addition, one can crank out professional-looking form letters using the computer, and even "personalize" them by coupling the text file with data files.

If one wants to write for publication, the computer can also be of enormous help. Articles, book ideas, and other publishable material can be stored on tape and manipulated any way one wants without a great deal of rewriting. However, there is one drawback; most editors and publishers, even those of computer magazines, prefer that articles be submitted in a standard format of 1¼" margins, on clean white paper, with double-spaced lines. Only the best daisy-wheel printers can give on letter-quality copy, and I know of no word-processor which easily allows the user to program in double-spaced lines. This is, however, no reason not to invest in a computer system; I have found that writing texts on the computer and then typing out a final copy on the typewriter still greatly reduces time expenditures.

Financial. With the many spreadsheet-analysis software programs available on the market, getting a grip on a church's finances can be done with ease. The Timex/Sinclair "VuCalc" software can be applied to church finances, as can the Timex/Sinclair "Budgeter" program. I have personally not tried this as yet, but I see no reason why such software could not be used in a church context. "VuCalc", for example, allows the user to input data in many different fields, and will automatically recalculate totals when information is added or deleted. This should be good news to church treasurers! Such software also enables the



user to make projections with data, just by changing numbers here and there! For those who want to see whether their church will meet its budget and other financial obligations, a computer would prove to be a useful ally.

II. The Computer in the Congregation: What?

Now that we have laid the groundwork, so to speak, and seen what wonders the computer is capable of achieving in the church, the question is, What system should the church buy?

None of the major magazines for clergy, nor any of the larger publishers of church software, make any mention of the Timex/Sinclair 1000 computer. Church-oriented software for the T/S 1000 is all but nonexistent. Nonetheless, I would like to go on record that no church needs to spend more on its computer system than I did no mine, which was nowhere near the $2,500.00 -- $3,000.00 that have been suggested by various authors and firms.

The integral component of my computer system is, of course, the Timex/Sinclair 1000 computer and the Timex/Sinclair 1016 16K memory module. I received them in December of 1982, when their combined cost was around $150.00. In March of 1983, I made the first major change to my system when I invested $75.00 (including tax) in a Suntronics KD-81 keyboard. The people at Suntronics, which is located out here in the Los Angeles area, were extremely helpful, and even installed my computer into the keyboard at no charge. And, just a couple of weeks ago, I received my order of a Seikosha GX-100 printer, a Memotech Centronics Parallel Printer Interface, the printer cable, and a Memotech Memotext Word Processor. These items were all ordered through the E. Arthur Brown Co., of Alexandria, MN. They even went so far as to throw in their Memosha software, for obtaining graphics characters, high-speed paper feed, and space-skipping to avoid perforations on fan-fold paper, for nothing. I also had to buy a portable black-and-white television set and cassette recorder, but I am not counting them in the price of my system. All together, then, I spent a total of $557.80 for an extremely reliable, versatile and flexible computer system which gives me word and data processing capabilities as good as one can find on a TRS-80, an Apple, a Commodore 64, or any other computer system. Clearly, I would recommend to any church the purchase of such a system. There is even an attachment on the market now, called the "Timebox," which upgrades the T/S 1000 into a system capable of accessing "thousands of CP/M based programs", according to their advertisements. Price: $199.00. Something to think about.

III. A Computer in the Congregation: How?

So, how does one go about assembling such a system? I recommend the following companies with which I have had successful dealings. By the way, the price of the T/S 1000 computer is now so low as to make buying one extremely practical; one discount drug store out here has been selling the T/S 1000 for $29.99, and the 16K module for $9.99!

Seikosha Printer Package $294.00
GX-100 printer, Memotech Interface
Memotech Memotext Word Processor $39.95
E. Arthur Brown Co. 612-762-8847
1702 Oak Knoll Dr.
Alexandria, MN 56308

KD-81 keyboard $59.95
Suntronics Co., Inc.
12621 Crenshaw Blvd.
Hawthorne, CA 90250
1-800-421-5775 213-644-1149 (inside CA)

IV. A Computer in the Congregation: Some Concluding Remarks.

I am wildly delighted with my Timex/Sinclair-based computer system; it works absolutely flawlessly and does everything it is supposed to. I have used it for, among other things, sermons, voluminous correspondence, and confirmation notes. The more I use it, the more I agree with E. Arthur Brown that the T/S 1000 is all the computer one will ever need. And, in the area of church work, I am convinced that a system such as I have just described presents a very real alternative to high-priced machines.

BANK SWITCHING FOR THE TS 1000-Part 3

by Paul Hunter

THE MEMORY BANK

SINCLAIR 16K RAM packs have fallen in price dramatically since they were introduced and at prices between $5 and $15 they provide an economical way to add memory to your system. They do, however, suffer from two serious disadvantages -- they are nonstackable and they are decoded only for the 16-32K block within a 32K system.

After experimenting with several ways of stacking the RAM packs together and destroying some in the process, the conclusion was reached very rapidly that it is essential to be able to test each RAM pack after any modification. So I ended up replacing the edge connector of the RAM pack with a new wire-wrap socket and pc extender board as shown in Figure 1.

STACKING THE RAM PACKS

1. Remove the four screws and take off the case.

2. Gently unfold the two pc boards. Avoid excessive folding and unfolding.

3. Rest the board on aluminum foil while working with it.

4. Cut off and sacrifice the edge connector -- it is impossible to remove intact without damage to the pc board. Leave sufficient pin in the board to make getting hold of it for removal easy.

5. Heat and remove the pins individually -- pull them out carefully and avoid tearing up the trace.

6. Drill out the holes.

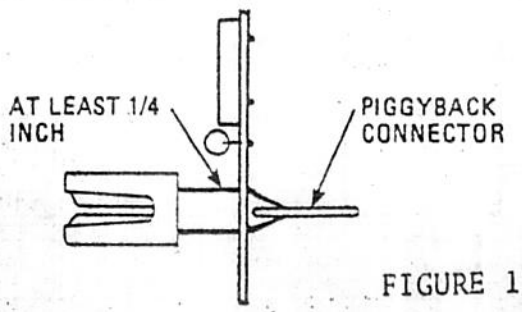


FIGURE 1

7. Insert the new wire-wrap connector as shown in Figure 1. Stand the connector off from the board by about 0.25in. Align.

8. Solder a pin at each end and check alignment.

9. Solder the remaining pins. In general solder a pin on the same side of the board as the trace to that pin. There are 9 connections on the solder side and 25 on the component side.

10. The board is not solder-masked -- so take care to avoid solder bridges.

11. It is absolutely essential to make reliable connections to GND, +5, and +9V.

12. Plug into a TS1000 and test.

13. Bend a pair of pins at each end of the connector in toward each other and squeeze in between a pc extender board. Align and solder these 4 pins.

14. Bend all the remaining pins EXCEPT A14 down on to the connector and solder. A14 will be used to select the board.

You now have a stackable 16K RAM pack -- the whole operation takes 30 to 40 minutes per board. Four RAM packs can be stacked together and secured rigidly with threaded rod and plastic spacers -- use the holes already available on the boards. The length of the spacers is 1 5/32in. The upper half of the unit can be held in line with plastic card guides. You should be able to obtain the 16K RAM packs for less than $10 these days. The wire-wrap connectors and pc extender boards can be obtained from several sources. If necessary, you can purchase the set:

One 16K RAM pack
One gold-plated keyed WW 22/44 connector
One slotted male pc extender board

from the author for $16 post paid.
See advertisement for address.

DECODING THE RAM PACKS

The SINCLAIR 16K RAM pack is decoded for use only in the 16-32K block. The decoding doesn't include A15 and, without modification, the RAM pack is restricted to use within a 32K system. Each RAM pack is selected by causing the A14 input to go high. This does not interfere with the refresh. For use in a full 64K system, the simplest modification gates A15 with M1 as shown in Figure 2. This precludes any op-code fetch from an address above 32K (But see Oliger, SQ Summer 1983 Page 47).

Note that the two RAM packs at 16-32K and 32-48K are treated as regular system RAM. The other two RAM packs are switched by the second half of the 74LS139. The BANK-SELECTION is made via the circuit illustrated last month. Bank 0 is selected upon power up by default.

TESTING THE RAM BANK

Test each RAM individually in a regular 16K system and then build up the RAM BANK step by step, testing the operation of the system at each stage and after each addition of another RAM pack.

Eventually you will have all four (80K), or five (96K), or six (112K) RAM packs attached. Upon power up both LED's on the control board will be off. RAMTOP will be set to 32768 by the system initialization. Check the value by:
PRINT PEEK 16388 + 256*PEEK 16389

POKE 16389,192 and then enter NEW. This resets RAMTOP to 49152 -- so you now have a full 32K of RAM in the system. Peek at the value of RAMTOP again.

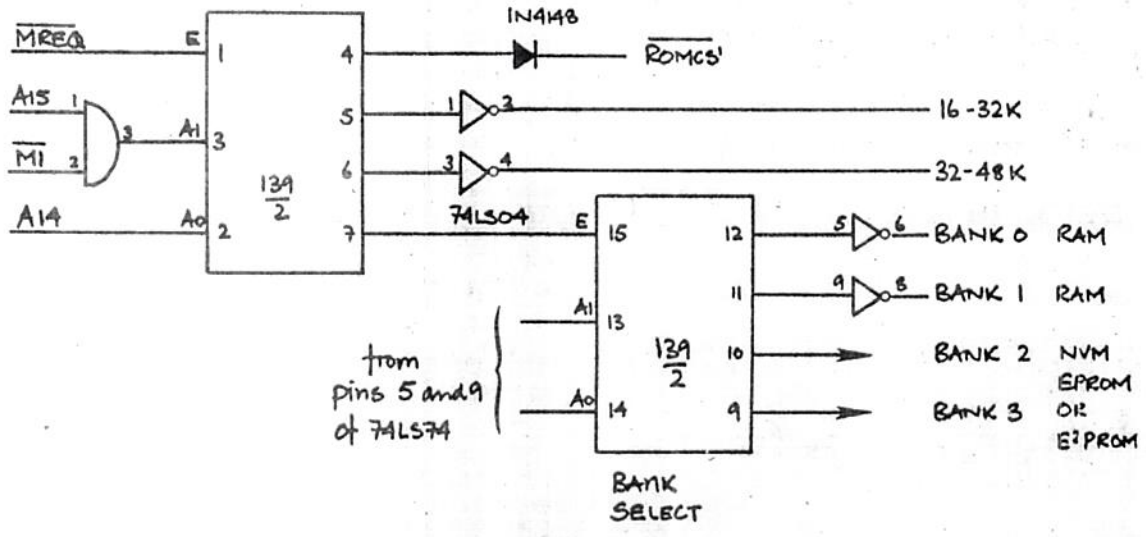
Now test the BANKED memory. A straightforward routine like the one below can be used:

```
10  REM PEEK X TAN          (ie OUT DEFB RET)
20  POKE 60000,1            store 1  for example
30  POKE 16515,111          switch to second bank
40  RAND USR 16514
50  POKE 60000,2            in contrast to 1 in
60  PRINT PEEK 60000        the other bank
100 POKE 16515,103          switch banks again
80  RAND USR 16514
90  PRINT PEEK 60000
100 POKE 16515,111          switch banks again
110 RAND USR 16514
120 GOTO 60                 loop
```

The program will run until the screen is full. It switches continually from one bank to the other -- printing the contents of location 60000 in each in turn. The first LED on the control board will turn on and off as the banks are switched.

Next month we will construct the nonvolatile bank and develop more of the firmware.

Many of you will have noticed the transcription error in the RECLAIM routine in PART 1. The byte 95 at 16524 should have been 93. This instalment is submitted in camera-ready form so all mistakes are mine.



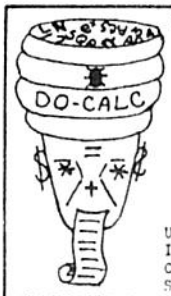
When you have constructed the RAM BANK try experimenting with the following routines. The addresses are omitted intentionally -- place the routine in a REM statement or down in the 8 - 16K REGION. The first routine loads the entire VARIABLES area into the 48-64K BANK selected. The second routine brings the variables back down, merging them with any new variables already there. A CLEAR or RAND USR 5274 will clear the VARIABLES area if desired.

```
205    35    15          CALL FAST MODE
237    91    16    64    LOAD DE VARS
 42    20    64          LOAD HL E_LINE
 43                      POINT TO BYTE BELOW
183                      OR A
237    82                SBC HL DE -- SIZE
 68    77                STORE SIZE IN BC
 33    48   192          LOAD HL STORAGE ADDR.
113    35   112    35    SAVE BC
235                      EX HL DE
237   176                LDIR -- DO TRANSFER
205   154    20          CLEAR VARIABLES
201                      RETURN
```

```
205    35    15          CALL FAST MODE
237    75    48   192    LOAD BC WITH SIZE
 42    20    64          LOAD HL E_LINE
 43                      POINT TO BYTE BELOW
197   229                PUSH BC, PUSH HL
205   158     9          CALL MAKE-ROOM
209   193                POP DE, POP BC
 33    50   192          LOAD HL STORAGE ADDR.
237   176                LDIR -- DO TRANSFER
201                      RETURN
```

ERROR:
T-S Horizons, #4, "Bank Switching-Part One" by Paul Hunter,p.14.
Byte at 16524 should be 93 (not 95).
Please note that the error occurred in transcription and was not the fault of the author.

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* ALL INSTRUCTIONS IN THE PROGRAM

Written in machine code and basic.

THE ZX/TS Scroll Kit

A scrolling utility for the basic programer who wants to add a professional and interesting look to his programs. The kit consists of 12 EASY to use USR routines. Note the following:

4 - Scrolling routines
4 - Rotating routines
3 - Inverse routines
1 - Instant screen fill routine

The ZX/TS SCROLL KIT comes with a 22 page user manual. Kit and demo on cassette. Written in machine code and basic.

ABOVE PROGRAMS ARE FOR THE ZX-81, TS-1000, and TS-1500 COMPUTERS WITH 16K RAM. Programs on high quality cassettes.

Send $10.00 for each program plus $2.00 shipping to:
(Ck or MO)

P B THORWARE
3808 North 97th Place
Milwaukee, WI 53222

A WORD PROCESSING PROGRAM



PART 2

BY GORDON YOUNG (1984)

"WORM"
A Word Processing Program for the Timex Sinclair 1000

By: Gordon Young

Part II

In the last issue of TS HORIZONS, I provided part 1 of this series which provided information to insert the machine code for line 1. As you remember, there are lines 2, 3 and 4 to go. Once all these are entered, you will have a versatile word processing program to work on almost any printer system.

Using the assembler from part 1, change line 9977 to read:

9977 LET N=17161

This will prepare you to enter the codes for line 2 (figure 1). Run the assembler program and enter all the codes from figure 1. There are 6 across, so enter the numbers from left to right, top to bottom. Again, be sure to SAVE your work form time to time for protection. Continue until all codes have been entered.

When line 2 has been entered, you can check your work by adding the checksum lines (8000-8005) in figure 3. Run the checksum (add line 8010 STOP to prevent the program from going into the assembler mode). It should print the result: 54186 if all your entries are correct. If so, you are ready to work on line 3.

Change line 9977 of the assembler to:
9977 LET N=17808

This will configure the assembler such that the codes from figure 2 can be entered to fill REM line 3. Follow the steps just as you did for line 1 and 2. When lines 1-3 have been entered, you have most of the 2K machine code complete. To test your line 3 entries, refer to the checksum portion of the program (figure 4). Again run the checksum. You should get the number 51476 printed on the screen. Figure 5 has the checksum results obtained for lines 2 and 3.

So far there has been nothing exciting about this program for you. Next month I will conclude the "WORM" program with part 3. In it there are about 200 more bytes to enter in line 4 and all the machine code will be complete. Afterwards, only some BASIC lines are required and "WORM" will be ready to use! I have worked on this program for over 4 months and after using it to write this article, I am pleased to share my effort with others who will take the few hours to make it run on their machines.

Also in the next issue, I will show you how to use it. This will only take a few minutes as I have made this as User Friendly as possible. If very many readers are using the TS-2068, I will convert the program later on for that machine.

```
8000 LET CK=0
8001 FOR N=17161 TO 17801
8002 LET CK=CK+PEEK N
8004 NEXT N
8005 PRINT "LINE 2 CHECKSUM=";CK
```

FIGURE 3

```
8000 LET CK=0
8001 FOR N=17808 TO 18440
8002 LET CK=CK+PEEK N
8004 NEXT N
8005 PRINT "LINE 3 CHECKSUM=";CK
```

FIGURE 4

```
LINE 2 CHECKSUM=54186
LINE 3 CHECKSUM=51476
```

FIGURE 5

LINE 3 REM CODES

FIGURE 8

FIGURE 9

INTERFACING BOOKS

Editor's Note: The following comparison chart of books for interfacing the TS-1000 was prepared by Paul Donnelly. Complete reviews of some books will appear in upcoming issues of TS Horizons.

TITLE	INS & OUTS [1]	CONTROL [2] THINGS	INTERFACING [3]	PROGRAM IN BASIC
AUTHOR	D. Thompson	Swarts	Downey & Rindsberg	E. Floegel
PUBLISHER	Melbourne House	Dilithium Press	Prentice-Hall	Hofacker
PRICE	$12.95	$6.95	$10.95	$9.95
CHAPTERS	4	13	11	9
PAGES	101	183	146	139
ILLUSTRATIONS	24	38	70	10
TS SCHEMATIC	-	-	YES	-
INDEX	-	YES	YES	-
FEATURES:				
I/O MAPPED PORT	YES	YES	-	YES
DECODING MEMORY	YES	-	YES	-
RAM-INTERNAL	YES	-	YES	-
RAM-EXTERNAL	YES	-	YES	-
CONSTRUCTION TIPS	YES	YES	YES	YES
LOGIC PROBE	-	-	YES	-
EPROM PROGRAMMING	-	-	-	-
PRINTER PORT-SERIAL	-	-	-	-
-PARALLEL	YES	-	YES	-
A/D-D/A	PART	YES	YES	-
IN-PORT	YES	YES	YES	YES
OUT-PORT	YES	YES	YES	YES
SOUND GENERATOR	YES	YES	-	-
DUMB TERMINAL	-	-	YES	-
JOYSTICKS	-	YES	YES	-
BIG KEYBOARD	YES	YES	-	-
POWER SUPPLY	-	YES	-	-
ML PROGRAMMING	SOME	YES	SOME	SOME
RATINGS:				
CONTENT	8	7	9	8
PRICE/VALUE	7	9	8	8
STYLE	7	8	8	7
OVERALL	7	8	8+	8-

Full titles of the above books:

1. The Ins and Outs of the Timex TS1000 & ZX81
2. Control Things with Your Timex Sinclair
3. Timex/Sinclair Interfacing

HARDWARE REVIEW

ITEM: ROMPAK
USE: INSTANT LOAD SOFTWARE

FROM: ROMPAK, INC.
SUITE 100, 8206 BLACKBURN AVENUE
LOS ANGELES, CA 90048
PRICE: $9.95 KIT, $16.95 A & T WITH ZIF
+ $2.00 P&H

At $9.95 I just couldn't resist ROMPAK's basic cartridge kit for 4 and 8K EPROMS. The thought of instant loading software was just too much. Of course, the ROMPAK is of little use on its own, so I also broke down and bought the $9.95 Galactic PAK test game.

The ROMPAK is a small (3" X 3") open, double-sided printed circuit board which plugs onto your ZX/TS expansion bus. A male bus extension protrudes out the back, so you can attach more peripherals (like a RAM Pack). The board is uncased and in the stripped version has a transistor for control of ROMCS, an LS138 selector for decoding, and a socket for 24 pin or 28 pin EPROMs. The more advanced version has a Zero Insertion Force (ZIF) socket which is probable a must if you plan to use more than one PAK. (ZIF sockets have a special mechanical construction, using a lever, which eliminates the wiggling and pin bending problems, which often accompany I.C. removal/insertions). No extra power supply is needed. You must use a 16K ram pack with ROMPACK, as the programs are apparently booted up into the BASIC area for execution. You do this with a RND USR command and are instantly into the software. One minor inconvenience, in the case of Galactic PAK, was that once booted to BASIC, the program can't be SAVED. It's easy enough to get around this (an LDIR to and from a long "1 REM" statement), but for those who like to experiment, a bit of a hassle.

ROMPAK's decoding scheme is a little strange, allowing easy use of the 8-16K area (A13 high pulls RAMCS high through a transistor), but not such easy use of other 8K blocks. This was apparently done to simplify trace layout, but makes it somewhat inconvenient to use. In any event, I don't recommend trying to map into other areas without a complete schematic. The instructions with ROMPAK indicate you can use other 8K blocks, and jumper pads are even supplied. But, no provision is made for ROMCS when other blocks are used (e.g., it's a simple task to install your own system ROM in the 0-8 block. With the decoding of ROMCS as is, however, both your ROM and the Sinclair ROM would be enabled at the same time unless you further decode the 138's output).

My "kit" came already assembled and for $9.95 I give the ROMPAK a 9 out of 10, based on price. Compared to TIMEX's 1510 module, ROMPAK lacks some features (e.g., RESET button and attractive case) but, the ease of access to the address lines helps to make up for this. I see ROMPAK as a very viable low cost EPROM holder for dedicated tasks. An example would be for a Solar Hot Water control station. You could design your system control using say a Byte Back BB-1 module, ROMPACK and 16K RAM (possibly even just the 2K). A RAND USR would be all you'd need to get it up and running - No tapes or recorder wires to worry about; even the TV set could be despensed with if you had an LED to show that the software booted OK. Such a software system could be developed on a Hunter Board, for example, and then transferred to EPROM. Total hardware cost $100.00.

While I didn't think much of the Galactic PAK software (a very simple "move through space" game), the ROMPAK hardware is simple, elegant and inexpensive and represents a good buy for the hardware experiments.

P.J. Donnelly
10 Idle Day Drive
Centerport, N.Y. 11721

SOFTWARE REVIEWS by

Tex Faucette

2068 GAME REVIEW

by Tex Faucette

German and Rumanian Armed Forces lost WWII in the winter of 1941. Despite the fearsome German PANZER units and their supporting German and Rumanian Infantry, the invasion of Russia, after its initial successes, slowed in the mud season, and ground to a halt before reaching Moscow. There in the area south of Lenningrad and well west of Moscow, the Proud Divisions and Brigades, including all reserve units dispatched from Berlin, were decimated, cut to Pieces by the stubborn Russian Cavalry, Tanks, Infantry, and Rifles.

As Supreme Commander of the German/Rumanian forces, the entire responsibility for this debacle rested squarely on my shoulders. All blame was mine, with only one small escape hatch left.

The Russians, even in the summer of '41 when my invasion began, were directed, the odds calculated, the units deployed, by a COMPUTER.

Is this a story of Time Travel? Is it SciFi (my apologies to those who hate that term)? Some strange tale of distorted Parallel universes? If you answered "NO" to the above questions, Proceed to the head of the class.

This review really begins with my first impressions, somewhat fictionalized, of my first serious encounter with a certain game Program for the Timex/Sinclair 2068.

* * * *

"WAR IN THE EAST (Invasion of Russia July, 1941), Copyright 1984 by Mark L. Stueber.

This is not, repeat, not an arcade type game. It is a strategic military game, were the Player matches his wits and military expertise against the computers defense of Moscow. The instructions for the game delineate the rules, odds, etc., by which both offense and defense are bound. The rules are fairly complicated, but will become more transparent to the human Player as successive invasions are attempted. There is no realtime limit involved, the game terminates after 30 turns (which the instructions suggest will take about 1-1/2 hours). A game may be SAVEd at the beginning of any turn for later continuation. The turns are enumerated in the upper left corner of the screen, and northwest of Lenningrad is a scorebox of the number of times that Moscow has fallen. If Moscow "falls" for four successive turns, you have won. The bottom edge contains a blinking "supply line" delineator (Remember Napoleon!). In case the invader, in surveying the overall battle map, forgets which unit is available to move, a touch of the "4" key will cause the eligible unit to blink for a moment. The "9" will terminate movement of a unit. Otherwise, moves are made one at a time by the four cursor keys. In all cases, the ENTER must be used, giving one a chance to reconsider before irrevocable commitment.

Order of Play is indicated by color of the border around the Battle Map, and units are designated by the color black for invaders and red for Russian. They are further distinguished by letters to indicate size and type of unit. Hereon lies my only serious criticism of the game.

WAR in the EAST

INVASION OF RUSSIA, JULY, 1941

16K, 32K, or TS2068

You command the German Invasion of Russia to take Moscow.

T/S 2068 Game has:

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- No fast reflexes required.

32K—IDENTICAL TO TS/2068, EXCEPT:

- Large 4 screen map board • No effects of terrain

16K—IDENTICAL TO 32K GAME, EXCEPT:

- 1 screen map board

T/S 2068 — $17.95
32K — 17.95 + $2.00 S & H
16K — 14.95

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I would find it much more interesting if Mr. Stueber had expended some additional effort to provide the superior graphic symbols available to the 2068 machines. It appears to me that despite his long and elaborate program (actually, three programs which are loaded from within), sufficient memory remains to provide, for example, a large tank of the appropriate color to indicate "Division" strength and a smaller tank to indicate a "Brigade", etc., etc.

Other than the above petty nit-picking, Mr. Stueber has designed a captivating game. It is my understanding that versions are also available for the smaller T/S machines, and suggest that you check the ads in your favorite magazines for a source nearby. Especially recommended for aspiring Generalissimos, etc.

Most surplus keyboards will have several spare keys. Wouldn't it be nice to put some of the more often used (SHIFTED) T/S functions on dedicated keys, have two shift keys like a regular typewriter, etc.? The Mule kit suggests two methods to do such customizing. A simple diode method will allow the EDIT, ", "", DELETE, STOP, FUNCTION, and the British Pound Symbol (which my present equipment converts to # for some unknown reason) to be accessed with a single keystroke. A more elaborate suggestion, which will yield quite a few more single stroke functions, uses low-cost bilateral switch chips. Chips, diodes, wire, solder, etc. are not included in the kit, but are usually readily available from local sources or mail order.

Real Soon Now, to borrow a phrase, my surplus keyboard will be stripped of the creepy-crawly things I cut from the original T/S 1000 "keyboard" and dressed up with MULE symbols. I like them!

Hardware Review

by Tex Faucette

KEYBOARD CONVERSION

MULE Electronics, Dept. 310P
444 Lincoln Blvd.
Venice, CA 90291

Tired of trying to achieve a reasonable typing speed on the ZX-81 or T/S 1000 keyboard? Forget the idea, give up, no way, Jose! To get real action from your little machine, treat it to a surplus, full size keyboard. It's easier than you think!

A good first step, especially for the non-technician, is to order MULE Electronics' kit. It contains an excellent schematic diagram, conversion instructions written for the non-technician, "customizing" instructions, and attractive keytop labels for your "new" keyboard. A small envelope is attached to the keytop symbol mounting instructions and contains two extra "test sample" symbols which should be used first to assure compatability of the adhesive with your particular keyboard.

If you have a good friend who is technically qualified, you might want to con him/her into doing the actual soldering for you. If not, just read and follow instructions included in the kit. And wait to purchase your surplus keyboard until you have read the instructions, for they contain plain language tips as to what to look for and what to avoid.



Even Gnorman, our gnome, had to expand that little keyboard. But he didn't limit himself to one of those expensive ready-made jobs. Gnor should you!

Why not use a full-size surplus keyboard (about $20, anywhere) to create your own *customized* console, our kit explains how:

- Do's and Don't's for selecting the right keyboard.
- Simple, illustrated instructions on how to hook it up to your TS1000/ZX81 computer.
- Additional instructions for adding Single-Key Shifted Functions (like single-key "DELETE").
- For the "pro" - A Schematic of the computer.
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"I have mounted your symbol set on my new keyboard and I can't compliment you enough. **I.N. - Randolph, MA**

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"... looks great, you've got a fantastic product there." **R.J. - Cypress, CA**

MULE Electronics - Dept. 310P
444 Lincoln Blvd.
Venice, CA 90291

$11.95 ppd*

*U.S. and Canada - Others please add U.S. $2. California residents add 6.5% tax. **MONEY-BACK GUARANTEE.**

BOOK REVIEW

by Tex Faucette

TIMEX SINCLAIR 2068 BEGINNER INTERMEDIATE GUIDE by Fred Blechman

Copyright 1983 by Fred Blechman

Howard W. Sams & Co., Inc., 4300 West 62nd St., IndianaPolis, Indiana 46268

SPECIAL NOTE: This book is the first of a Planned 2-Volume Series. The second volume, TIMEX SINCLAIR 2068 INTERMEDIATE/ADVANCED GUIDE, by Jeff Mazur was Placed in a "hold" status when Timex exited the home computer market. I recently received information from SAMS that the second volume WILL be Published, tentative date for Publication being September 1, 1984. I believe that Howard W. Sams & Co. should be congratulated for their decision to Publish, and I am eagerly awaiting the new volume.

Author Fred Blechman uses the KISS (KeeP It SuPer SimPle) aPProach in this volume. He has has done an excellent Job Pointing out the Power and unique features of the 2068, and comParing the 2068 to its SPECTRUM Predecessor. Each chaPter of the book is followed by a number of review questions with correct answers Provided in an aPPendix.

Mr. Blechmans KISS technique makes this volume a very friendly suPPlement to the Timex users manual. It is liberally sPrinkled with short routines and serious Programs to acquaint the user with the various color, music, and sPecial characters which can be utilized. Some color and graPhic routines from various chaPters are illustrated in 8 full color Photos.Among the "serious" Programs are a "Long Distance Navigator" (which uses sPherical trigonometry, one of the reasons I am a college droP-out). This Program is of definate value to radio oPerators, short-wave listeners, etc., as it is designed to suPPly accurate direction and distances to and from anywhere on the earths surface.

Like to have your 2068 show off by drawing the American Flag and Playing "America the Beautiful"? It's in the book! I really consider this book, as well as the forthcoming sequel, to be in the "must have" catagory.

SOFTWARE REVIEW

by Tex Faucette

"CHECKREC" (ZX81/T-S 1000, 16K)
CoPyright 1984 by WMJ Data Systems, 4 Butterfly Drive, HauPPauge, NY 11788

As the future of the Timex-Sinclair computers is now somewhat dePendent on third-Party software suPPort, it is quite gratifying to encounter a new Program designed for the T-S 1000.

"CHECKREC" is Probably best described as a "dedicated sPreadsheet", and it is a rather elaborate method of reconciling ones monthly bank statement. It disPlays 60 transactions (although it recommends that only 51 be used), which might even be adequate for some small businesses. It certainlly has enough sPace for a quarterly, or even semi-annual reconcilliation of my Personal account!

"CHECKREC" is suPPlied on a cassette which also has a "TEST" which may be used to adJust volume before loading the main Program. The main Program takes 4 minutes to load, and must be started with "RUN". Programs saved with data are auto-start and may take well over 6 minutes to load, dePending on the amount of data stored.

The main menu choices are "ENTER CHECK", "ENTER DEPOSIT", "VIEW SPREADSHEET", "PRINTOUT TRANSACTIONS", "RECONCILE ACCOUNT", and "SAVE TO TAPE". Corrections may be made at any time, and all figures are uPdated accordingly. The sPreadsheet is machine code generated, and sPeed of oPeration is quite adequate. Scrolling is controlled with the arrow keys.

Printout is configured for the standard 32 column Printer, and is controlled by a sub-menu which allows selection of "ALL TRANSACTIONS", "RECONCILIATION SUMMARY", "OUTSTANDING CHECKS", and "DEPOSITS IN TRANSIT".

On a test run the Program Performed in strict accordance with the documetation suPPlied. Intentional "breaks" restarted with "GOTO 100" left all data intact. No unintentional "breaks" were exPerienced.

For those who have use for this tyPe of single-PurPose sPreadsheet, and can live with the 32 Column Printout and 51 transaction Per sPread limitations, "CHECKREC" may be ideal. It's quite a bit of Program for 10 bucks.

*CUSTOMIZED DATABASE PROGRAMS(menu driven) Music Library--Stock Plot--Phone Book and more-Send For Catalog
SOFTWARE SOLUTIONS
927 Mears Court
Stanford, CA 94305

REVIEWS FOR THE NON-PROGRAMMER

By: A. Gindin

Many authors have suggested various devices to reduce radio frequency interference when using a TS 1000/ZX 81 based system. This interference can cause distracting wavy lines running across your TV set. One solution is a monitor. This bypasses much of the electronics of the TV. Monitors are available beginning at $20 used but require major hardware modification for the TS 1000. Others have suggested using a UHF channel, more grounds, etc. However, for only $3.99 you can buy part no. 15-1535 from Radio Shack. This is a better coaxial cable than that supplied with the Sinclair and has made a dramatic difference in my system.

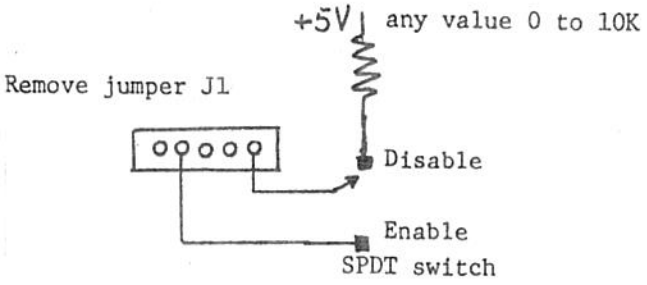
- I am still looking for a cheap word processor. This article is being typed using "Typeset", a 26 line program from Vol.1 No.1 BASIC COMPUTER NEWSLETTER. It has no editing features but gets the print to the printer.

- The big expensive computers are now offering programs that enable one to run or at least see on the screen several programs at once. They also enable one to integrate data from these various programs into a single document. However, according to a review by Don George in Personal Computer Age, January, 1984, of one of these ("Concurrent CP/M") most of us probable don't need 4 programs running at once. All we really need is a program that partitions memory so that we can deal with several programs without having to load and save repetitively. Naturally this feature is available on the ZX/TS via a program called "Multiple Programs in Memory" (MPIM). Suitable for 16 or 64K, it is sold by JRC, Box 448, Scottsburg, IN 47170. The programs sold for larger computers allow you to swap data between programs. I have not tried this with MPIM but it should be possible just as it is possible to merge programs in BASIC.

- Hunter has added a note to his directions to allow one to use the Hunter board along with other devices in the 8-16K slot:

Note 2 DISABLING THE NON-VOLATILE RAM BOARD

Most reliable operation is achieved when the NVM board is left plugged into the computer. A problem arises when you need to use another device which also makes use of the 8-16K block. One solution is to omit the corresponding 2K 6116 IC -- for example, if you wanted to use a memotech centronics IF with the board you could omit the second 6116LP-3 (socket 1). An alternative solution is to disable the board when another device requires the 8-16K block. In fact using this method, several NVM boards can be attached at the same time. The best way to disable the board is shown below. It has the advantage of not interfering with the ROMCS' signal.



It's a good idea to disable the board (or hold down the reset switch) when powering down your system.

- Eric Reiter of Computer Continuum was kind enough to show how to similarly control other devices in the 8-16K slot. Simply put a SPST switch in the MREQ line if the peripheral is memory mapped or the IORQ line if it is I/O mapped. I used a SPSP micro miniature toggle switches from Radio Shack and glued them to the board at the "Q" end of the device (my left). If the device has a cover you will need a carefully-placed hole for the toggle. I have set up="on" to match my Memocalc.

SOFTWARE REVIEW

By Walt Gaby

W P 3 2

Product: WP32 Word Processor
Machine: TS 2068
From: GE550 Software
3436 Bay Road
Redwood City, Ca 94063
415/369-9136
Price: $24.95

****

WP32 is a wordprocessor and much more!!! This program, written by Bob Orrfelt, has five major components:

1. Word Processing,
2. Banners,
3. Special Characters,
4. Hex Utilities, and
5. Save/Load.

The wordprocessing component has five sub-parts: text, headlines, single lines, screen graphics, and format/print.

The text element provides for up to 320 lines (15 screens). Full-screen editing includes letter deletion, letter insertion, line deletion, line insertion, line copy, and deletion of a block of lines.

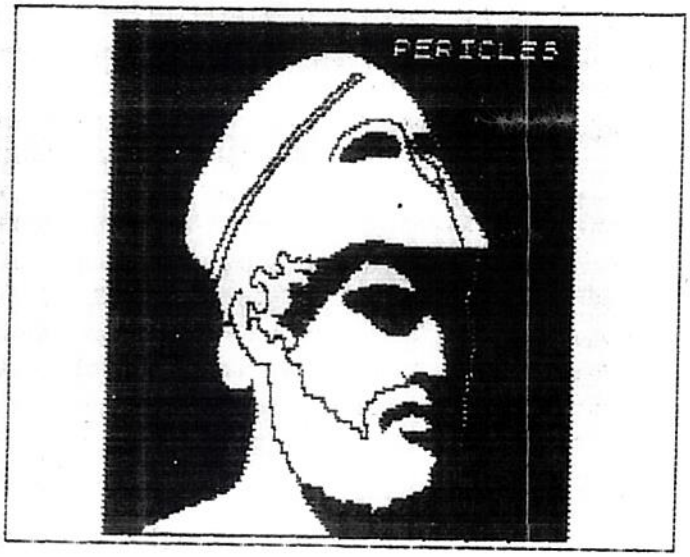
With 320 lines, it is easily possible to work on several letters or memos at the same time. This article, for instance, uses only 160 lines; while writting it, I occasionally switched to a memorandum that I was preparing for my partner.

The second subroutine allows for the creation of up to eight quarter-inch headlines...

SUCH AS THIS

The single-line section provides a place for up to eight lines of standard text for such purposes as a letterhead that you wish to include as part of the printout or for notes that you would not want to print in your final document. These single-lines can be in inverse video as in the first line of this article.

The screen graphics section provides a powerful set of methods for generating exhibits for inclusion in your letters or documents. These include a box to frame the exhibit, text statements, circles, lines (anywhere from straight to half-circle in form), and the ability to plot and erase complex drawings pixel by pixel. Here is an example of the latter feature:



The last section of the wordprocessing component provides for formatting your document and producing hardcopy on a TS-2040 printer. The user simply identifies the sequence of blocks of text, headlines, single lines, and exhibits. The sequence can also include special spacing and lines between the elements to be printed.

The second major component of WP32 provides for the creation and printing of banners. These banners can have letters which are either 1 inch high or 2.5 inches high.

The third major section of WP32 offers a choice of four special sets of 21 additional characters (available through the graphics key): general symbols, scientific symbols, Greek letters, and Spanish letters.

The next major sub-program provides a choice of a Hex Peek or a Hex Poke routine. Following the input of a starting hex address, the Hex Peek routine will generate a printout of decimal address, hex address, and hex byte. The Hex Poke routine lets the user input hex bytes starting at any selected address.

I used the Hex Poke routine to replace the Greek letters with Russian letters:

Б Г Д Ё Ж З И Й Л П
Ф Ц Ч Ш Щ Ы Ь Э Ю Я

The results of the hex routines, of course, remain in memory even after you clear the WP32 program with the NEW command.

The final major component of the WP32 package includes the Save-Load routines. The user has the choice of saving everything, or just the headlines, or just the text, or just the graphic exhibit. The same four choices are availble with regard to loading.

The documentation which accompanies the WP32 program is very well organized. The instruction, whether by explanation or by example, is such that the user can begin using all of its features in a very short time.

The manual also has an appendix which contains a complete listing of the machine code for the standard ROM characters as well as for the four special sets of additional characters.

Since this program is written in BASIC, typing has to occur at a slightly slower pace than with a typewriter. But it is easy to learn the pace. The WP32 does not include a few features found in many word processors. For instance, it does not provide margin justification..but that is a feature which I think is greatly overrated.

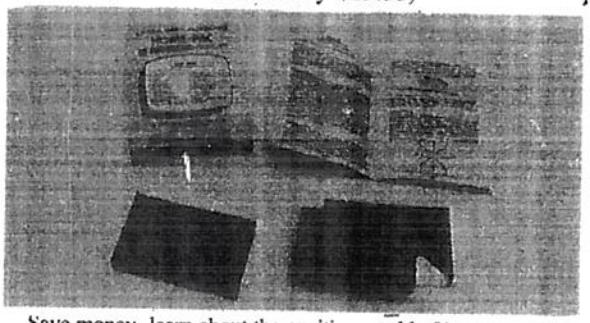
Considering the many features of the WP32, it is a very good program indeed!

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DEALER INQUIRIES INVITED

NEWS FROM SINCLAIR

The following information is largely condensed from The Sinclair Bulletin - an internal publication from Sinclair Research Ltd (23 Motcomb St., London, SW1X 8LB, England). A copy was forwarded to me by George Mockridge of Timelinez and the Bay Area T/S User Group (P.O.Box 1312, Pacifica, CA 94044).

- Sinclair Research signed an agreement with Samsung Electronics of the Republic of Korea, on March 7, 1984. The agreement allows the local assembly of ZX81's and ZX Spectrums within Korea, and was effective immediately. According to the bulletin all peripherals would be provided to Samsung by Sinclair.

Samsung is already a major exporter to the US, and, as Korean electrical codes and electronic specifications are largely copied from US standards, some Americans are predicting that Samsung will export ZX81's and Spectrums to the US on a large scale.

Third party vendors are now developing "Spectrum emulators" for the TS2068, which would allow 2068 owners to have access to products developed for the Spectrum.

- Both the ZX81 and the Spectrum have achieved one million sales worldwide, and are available in 50 countries (but not in the US)

- Chris Cowsley is in charge of "Sinclair's quality and support engineering," which entails the enormous job of providing "basic logistics: spares supply, technical information, service aids and training" worldwide.

- 52,000 Spectrums and ZX81's have been sold in Spain, giving Sinclair a 58% market share. (The main competitor is Commodore with a 23%. Where are Apple and IBM?) Reviews of Sinclair computers appear in every type of magazine and newspaper. Ten banks have installed Spectrums in their offices, and 20 more are considering it.

- The French press is impressed with the new Sinclair QL.

- Four separate publishers in England are planning to produce QL user magazines.

16K TS 1000/1500 ZX81
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A challenging educational word game for your entire family. Helps build todays necessary vocabulary and spelling skills.
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QUALITY ZX-TS SOFTWARE
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Enjoy this exciting game! Up to 6 players may play. All hands simultaneously displayed. Las Vegas rules apply, with computer holding all bets! Allows splitting pairs, doubling down & insurance. Great for testing your strategy.
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Provides quarterly graphic display of your bill status, with bills due search by desired date. Summaries of expenses paid, averages, & expense as % of income. Printer option included.
CALENDAR PLANNER (Menu driven) (16K)
Scratchpad calendar. Up to 200 personal events may be filed. Add or delete anytime. Files stay in order of date! 12 search modes display appointments, auto maint., Honey Do's, jobs, etc. Also allows viewing desired week, month, or year.
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The Wizard Works
Box 65, Walkerville, MI 49459

COMPUTER OPPORTUNITIES

How to make it on your own with computers. New product forecasts, used equipment and residual value studies, price/performance studies, DP spending analyses, evaluation of acquisition methods. What's new and what's best in hardware, software, courseware, databases, networking, publications, grants, videodisks and consortia. Money-making opportunities for microcomputer owners. Business ideas, opportunities, pitfalls to beware, marketing hints and sources for the micro-entrepreneur. The booming computer industry has produced an explosion in hardware and software that offers confusion to some computer owners and enlightening predictability to others. The key to business success in the computer business is good information. Yet the business experience from which good information is derived can be very expensive. The experts who publish the services offered in this unique package are professionals with long experience and who devote their full time to their work. Here's how you can obtain the fruits of their experience for less than 90¢ apiece. Through this bargain-packed offer, SELECT INFORMATION EXCHANGE, America's leading financial subscription agency, makes available to you a selection of 16 sample subscriptions to a variety of money-making, money-saving DP publications, magazines and newsletters. Their regular subscription prices range as high as $295 apiece. Your price for the entire package under this amazing one-time-only offer is $14, or about 90¢ apiece. Exact descriptions of each of the 16 publications are below. To order the entire package of 16 sample subscriptions, merely complete and return the coupon below, along with your $14 remittance.

1. FINANCIAL & INVESTMENT SOFTWARE REVIEW. Receive a sampling of articles from past issues. Contains investment software reviews, and unique articles on investing strategy, with a special focus on micro-computerized investing. **1 Yr, $60.**

2. SMALL BUSINESS COMPUTERS. The practical computer magazine for businespeople. Offers clear solutions to problems common to microcomputer users. Includes in-depth reviews of equipment and software, industry news, and new products. A non-technical approach for individuals considering a computer purchase as well as for those who already own a system. **1 Yr, $12.97.**

3. COMPUTER ECONOMICS REPORT. The financial advisor of DP users: new products forecasts, current third party lease prices, used equipment prices and residual values forecasts, price/performance charts, tax and law factors, data processing spending analyses, evaluation of acquisition methods. **1 Yr, $295.**

4. SCOPE. Designed for developers and users of software for instruction, research, and communication on the university level. Reports on hardware, courseware, databases, networking, publications, campus news, grants, videodisks and consortia. Especially useful is an international calendar of related conferences. **1 Yr, $47.**

5. COMPUTER EXECUTIVE LETTER. Information to assist and support the decisions of DP executives: cost of ownership, analyses of new product announcements, DP personnel salaries, evaluation of price versus performance, forecast of future products, residual value forecasts, and more. **1 Yr, $195.**

6. COTTAGE COMPUTING. Monthly magazine designed to help microcomputer owners cash in on the booming computer industry. Each issue is packed with factual articles, news, trends, case studies, money-making opportunities, pitfalls to beware, and much more. Learn how others are making cash with their computer and how you can join them. **1 Yr, $14.**

7. COMPUTER FRAUD & SECURITY BULLETIN. Reports on techniques of computer crime, security management, management audit and financial control, recruitment and employee screening, new security hardware and software. Written for auditors, inspectors, DP managers, financial and corporate management in computer using companies —especially banks, finance houses, etc. **1 Yr, $190.**

8. COMPUTER SHOPPER. A buy, sell and trade publication for computer equipment and software. Bargains from individuals and dealers worldwide. Approximately, 84 big 11" × 14" pages every month. **1 Yr, $10.**

9. MICRO MOONLIGHTER NEWSLETTER. Devoted exclusively to aiding the owner of a personal computer in the creation, building, and maintenance of a home-based business. Contains business ideas, marketing hints, and sources for the micro-entrepreneur. **1 Yr, $25.**

10. MICRO M.D. JOURNAL. Focuses on Hi-Tech and Medical stocks with comprehensive analysis of stability and growth potential using highly successful measures of market momentum. Provides reviews of new financial software for tax management, stock investment and commodities trading. In depth reports on computer applications for the health professional. **1 Yr, $60.**

11. COMPUTER DESIGN: Serves those companies or organizations concerned with design and application of Digital Equipment and Systems in computing, data processing, control and communication. This field covers engineering activities being applied in industry, government, the Military, business and the sciences. **1 Yr, $50.**

12. EDP WEEKLY. Industry Reports Inc. The top news in the data processing industry, plus digest of new contract awards. Government procurements, of orders, installations and applications of EDP equipment; highlights of Wash ington events that affect EDP business; listings of new products and literature; business, financial and corporate news, major personnel changes and upcoming events. **1 Yr, $120.**

13. PERIPHERALS DIGEST. Industry Reports Inc. A sophisticated newsletter directed to Executives in Electronic Data Processing covering converters, data communicators, disc, displays, drums, OCR, plotters, printers, remote computing, tape and time-sharing. **1 Yr, $88.**

14. SOFTWARE DIGEST. Industry Reports Inc. A bi-weekly roundup of significant developments in all areas of the computer software industry. **1 Yr, $88.**

15. WORLD SOFTWARE MARKETS. Coverage of microcomputer software markets world-wide. Overseas business opportunities for software publishers/distributors. Market trends. Turnkey projects. Overseas publishers distributors seeking franchises, licensing, joint-venture development. School use of microcomputers. Leading machines. Distribution and marketing channels. **1 Yr, $60.**

16. BUSS. Covers Heath Kit and Zenith micro-computers with announcements of new Heath Zenith compatible products, reports of user's experiences with their systems, news about Heath/Zenith corporate activities and user community events. "Assistance Wanted" and "For Sale" columns. **1 Yr, $28**

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Own personal computer? (A) Yes (B) No. Plan to buy within year? (C) Yes (D) No. Want free PC magazines? (E) Yes (F) No. Any children under 18? (G) Yes (H) No. Brand owned or to be bought: (I) Adam (J) Apple (K) Atari (L) Commodore (M) Compaq (N) DEC (O) Epson (P) IBM (Q) Kaypro (R) NEC (S) Osborne (T) Pet (U) Radio Shack (V) TI (W) VIC (X) Vector (Y) Xerox (Z) Zenith (2) Other

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NOTE: Publications listed in this ad are those participating in the offer at the time the ad was prepared. Over the course of time, many of those listed might discontinue or withdraw from the offer. When this occurs, other publications of the same general substance are substituted. Therefore, some of the publications actually received under the offer might be different from some of those listed in the ad.

ITEM: Tex Faucette sent us the following information on a source of supply for Timex users. Jim Houston of the San Antonio Sinclair User Group, has a stock of items including English-made ZX-81's, Times Software, the AERCO 2068 Parallet I/F, etc. Visa and Master Card orders accepted. Call (512)227-7363 or write 402 Pedro Avenue, San Antonio, TX.

ITEM: ENGINEERING PROGRAMS, from Banta Software, 8088 Highwood Way, Orangevale, CA 95662. (For the TS1000, 16K)

- BEAM DESIGN: Calculates shear force and moment diagrams for statically determinant beams with concentrated and uniform loads; finds normal and shear stresses for given section or section modulus for given stress.

- PIPE FLOW: Calculates the Reynolds number & friction factor for a given flow condition & finds the head loss in piping systems which include straight pepe, bends, valves, contractions and enlargement.

- HOME HEATING COSTS: An analysis of effects of types and amount of insulation, building size, configuration and construction, climate, and various fuel costs.

ITEM: Customized data bases (ZX81, TS 1000, 16K) from Software Solutions, K.C. Smith, 927 Mears Court, Stanford, CA 94305. $14 each.

- Stockplot - Plots prices and volumes for 19 stocks over 26 weeks. Tabulates other useful information.

- Membership directory - names, addresses, phone numbers, dues, and special interest codes (up to nine) on up to 70 members.

- Phone numbers - 90 entries. Good for printing mailing lists.

- Music library - 100 entries.

- Also customized programs written. Send specs.

ITEM: BANTA SOFTWARE announces the release of their SCREEN-SOLV electronic worksheet. This program is intended for use by engineers and others who have need to solve algebraic or trignometric equations and definite integrals. Up to 28 equations can be entered in algebraic form. Integrals are entered using the standard long "S" integral sign and limits. For example, the well known quadratic equation and the integral of SIN θ would be entered:

$$X = \frac{-B + \sqrt{B^2 - 4AC}}{2A} \qquad Y = \int_0^m \text{SIN } \theta \, d\theta$$

The integrations are done using a 10 part Gaussian approximation which gives accurate results for most continuous functions. The SCREEN-SOLV program allows the use of up to 48 user defined variable names of one to five characters which may include the commonly used Greek letters. In addition the user can store values in six arrays of 96 elements each.

The values of unknowns are automatically requested by the program. The results are automatically displayed in tabular form or they can be displayed in graphical form using the built in PLOT routine.

For the TS2068, $24.00.



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SECRETS REVEALED

The computer industry is filled with success stories in which people have soared to great profits in a short period of time. The book's author, Ed Simpson, started his computerized mail list service and was reaping profits in 3 short months. This book reveals the secrets he and others used to obtain fast, high profit growth. You can apply these same techniques and watch your business expand.

NO EXPERIENCE NECESSARY

You do not need to be a computer expert to make money in this industy. The author himself had no previous computer knowledge before starting his successful business. Often you do not even need to own a computer and can start with a very small investment! This book does not stop with the descriptions of microcomputer based businesses but also reveals the marketing techinques so vitally necessary for you to succeed.

CONTENTS

This book is packed with detailed examples of how to make money with a microcomputer related business. Contains practical knowledge.

- Word processing service
- Software publishing
- Selling computer supplies
- Mail list services
- Computer games
- Newsletter publishing
- Computer repair center
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ITEM: ZX EXCHANGE is a worldwide group of users dedicated to the ZX81 and TS1000/1500 computers who have gotten together to exchange programming expertise and information about all aspects of the little wonder. The main organ of the group is "ZX BROADSHEET", a newsletter which comes out at approximately bi-monthly intervals, but many participants also correspond directly. ZX EXCHANGE is a truly international network, with contacts currently in the U.S.A., Hong Kong, Mexico, Australia, Eire, The Netherlands and the U.K.

Apart from routines, which are its main feature, the newsletter also regularly includes "EXCHANGE PROFILE", a column in which people can say something about themselves, their equipment, and interests, so that others can contact them. Many useful contacts and a number of firm friendships have been made, with mutually beneficial results, between ZX81 users of different countries and cultures. Intermittently, the newsletter also features: a magazine list, giving information about publications that regularly deal with the ZX81; occasional reviews of software and hardware; product news; and gossip. In addition to the newsletter, "TAPE-CHAIN" is an exciting scheme which is fun as well as educational.

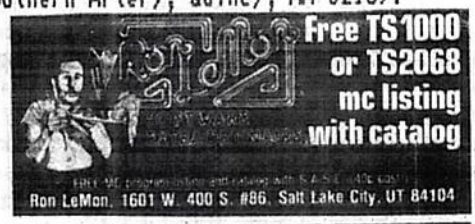
Details of ZX EXCHANGE and a trial issue of the newsletter can be obtained by sending 60p (UK) or four International Reply Coupons (elsewhere) to: Nick Godwin, 4 Hurkur Crescent, Eyemouth, Berwickshire, Scotland, TD14 5AP, U.K. Or telephone Eyemouth (0390) 50965 from 10am to 10pm U.K. time, and ask for Nick.

ITEM: 2068 Word Processors:

- WP32 - Gesso Software, 3436 Bay Road, Redwood City, CA 94063, $24.95. Author: Bob Orrfelt. Features include: Word Processing (with TS 2068) banners, user-defined characters, hex utilities, 4 additional character sets (German, Greek, Scientific and general symbols).

- Word! - Maranatha Software, P.O.Box 759, Mableton, GA 30059, $13.95. Machine code for speed. Cursor control, on-screen editing, definable tabs, menu-driven, search feature. To be reviewed in future issue.

ITEM : UPLOAD-2000 is a program to convert TS 1000 programs to run on the TS 2068. Warning : BASIC programs only. (No machine code). Written by David Onstein. $19.95 from 21st Cent. Electronics, 6813 Polk, Guttenburg, NJ 07093 and EZ Key, Suite 75, 711 Southern Artery, Quincy, MA 02169.



GOLFERS

GOLF HANDICAPPER is a menu driven 16K BASIC program for your TS 1000, 1500, ZX81 which computes/saves/updates USGA handicaps for up to 48 players. With a printer attached you can print out scores and handicaps for all players. High quality cassette tape shipped in hard box and accompanied by full documentation. Send $20 ck/mo to John Carson 11200 Lockwood Dr. #307 Silver Spring, MD 20901

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P.S.

As the TS 2068 has become more widely available, we have found that many of our readers have bought the new machine. Several of our subscribers have the TS 2068 only and have no use for articles for the TS 1000/ZX81 (except those that have applicability to both computers). While we have been fairly successful in obtaining TS1000 articles and programs, good informative 2068 articles have been harder to come by. If you are interested in writing for T-S Horizons and helping to keep fellow Timex/Sinclair users informed, please write. Although we still want to maintain a strong TS 1000 emphasis, we also need material for 2068 users.

The following point has been mentioned before but it bears repeating.
If you buy something from a company that advertises in T-S Horizons please be sure to tell them where you saw their ad. This helps the company decide where to spend its advertising budget. It helps T-S Horizons obviously. And I think ultimately it helps you. This goes for all inquiries made from items in our T-S News section or other places in T-S Horizons.

Until next time,
Yours,

Rick

Rick Duncan

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TIMEX has left, but we HAVEN'T! Just look at the software we've gathered up for you TS 2068 owners! This QUICKSILVA software has been marketed in Europe for over a year and is now considered to be among the finest available! Now we've got them all for your TS 2068 on cassette. Every order for QS TS 2068 software will receive a 1984 QS Calandar absolutely free!

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Timegate (No. 1 in Europe, don't miss it!)....$24.95
The Chessplayer (Very best talking chess!)...$24.95
Xadom (3D Graphics Arcade/Adventure!)........$24.95
Smuggler's Cove (Hi-Res Graphic/Text Adventure-Educational/Historic)........$24.95
3D Strategy (3D Tic-Tac-Toe!)........$24.95
Bugaboo (England loved it, you will too!).....$24.95

And TIMEX 1000/1500 owners, we haven't forgotten about you either!

Just look at what goodies we've dug up for you! QUICKSILVA also makes programs for your computers! And we've got them.

3D Black Star............$9.95 Damper & Glooper..............$9.95
Croaka Crawla............$9.95 Munchees......................$9.95
Pioneer Trail..................$9.95

SOFTSYNC also markets software for the TS 2068 and we've got that now too! These people are no strangers to you and neither is their work, so without further ado, here they are.
Personal Accountant........$24.95 Voice Chess..................$24.95
Gulp Man...................$19.95 Zeus Assembler...............$19.95
Cyberzone.....................$19.95

And look at this TS 1000/1500 software! We challenge anybody to beat these prices! This software is brand-new and up to 50% off list!! ALL of these are in limited supply so ACT NOW!!!

Name	Reg. List	Sale
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Programmer's Toolkit	$14.95	$9.99
SuperChess	$16.95	$9.99
Alien Invaision (Spc. Invdrs)	$14.95	$9.99
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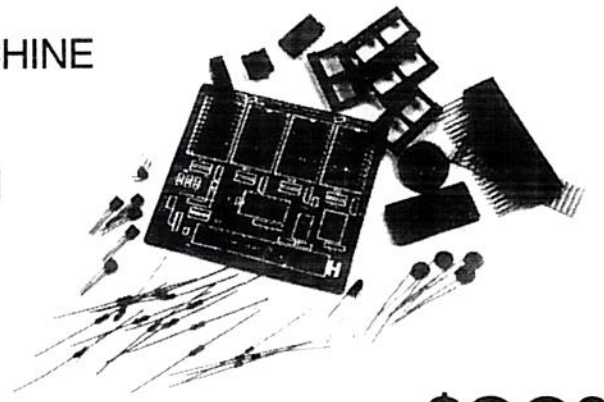
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